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EXAMINER

AMARI, ALESSANDRO V

| ART UNIT | PAPER NUMBER |
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2872

DATE MAILED: 07/15/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/806,936

Applicant(s)

POTIN ET AL.

Examiner

Alessandro V. Amari

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 14, 16-23 and 25-28 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 14, 16-23 and 25-28 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____ 6) ☐ Other: ____

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 14, 16-23, 25, 26, 27 and 28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 14, 27 and the claims dependent therein, the recitation of a first intermediate image is misdescriptive of the invention. Figure 3 of the Applicant's invention shows that the spherical mirror is located after a first intermediate image so the combination of the imager and the off-axis spherical concave mirror cannot form a first intermediate image as currently recited. Furthermore, the first intermediate image 25 is also misdescriptive in that the path of the light rays from the imager 20 is such that the first intermediate image would be formed in the first part or section of the optical device as is shown at 27.

Claim Objections

3. Claim 16 is objected to because of the following informalities:

Regarding claim 16, line 2, the phrase "the intermediate image" lacks antecedent basis.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 14, 16, 20, 23 and 25, 26, 27 and 28 are rejected under 35 U.S.C. 102(b) as being anticipated by Wood U.S. Patent 4,763,990.

In regard to claim 14, Wood discloses (see Figure 2) an optical device for a helmet viewfinder presenting a collimated image to a user, comprising: an imager (20a) and an off-axis spherical concave mirror (12) forming a first intermediate image; a diffractive field mirror (28) for correcting distortion of an image presented to the user which is due to the off-axis spherical concave mirror wherein the distortion corrected by the diffractive field mirror is an off-centering distortion of the second kind corresponding to an absence of symmetry of revolution caused by the spherical concave mirror being viewed at an oblique angle with respect to an axis of the spherical concave mirror as described in column 3, lines 10-40, and wherein the diffractive field mirror is situated in a vicinity of a second intermediate image (54) reflected by said diffractive field mirror, the vicinity having an extent limited to a maximum distance of the image beyond which resolution of the image at a center of a field of the device is degraded. Although the prior art does not specifically disclose correcting off-centering distortions, this feature is seen to be an inherent teaching of that device since the device has an off-axis mirror, which creates a misshaping of the image, and the device corrects for this negative

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distortion in order to present a proper image to the observer. Furthermore, it should be noted that the position at which the diffractive field mirror (28) is positioned is a maximum beyond which degradation will occur. In that, Wood teaches (see column 4, lines 12-20) that in order to produce a non-aberrated image to the pilot then the relay optics (26) must cooperate with the diffractive field mirror to form a preaberrated or intermediate image (54). Therefore this position is limited to the maximum distance from the intermediate image in order that the image not be degraded. Examiner would further note that the recitation of the first intermediate image is not distinctly claimed due to the ambiguity as to how the intermediate image is formed (see 112 rejection above).

Regarding claim 16, Wood discloses that the diffractive mirror is placed said maximum distance from the intermediate image as described in column 4, lines 12-29. (See note for claim 15 above in regard to position of diffractive mirror).

Regarding claim 20, Wood discloses that the diffractive field mirror is a volume hologram recorded in a photosensitive material as described in column 3, lines 36-40 and column 6, lines 3-24.

Regarding claim 23, Wood discloses a power group placed between the spherical mirror and diffractive mirror which focuses the first intermediate image (54) in proximity to said spherical mirror onto the second intermediate image as shown in Figure 2.

Regarding claim 25, Wood discloses (see Figure 2) that one or more optical power groups or optical relay groups (26) placed in a path of rays between the imager

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and the spherical mirror, upstream and/or downstream of the diffractive mirror, the one or more optical power groups comprising one or more lenses, at least one lens of which is convergent so as to give an aperture of the beams incident on the diffractive mirror which is smaller in comparison with an aperture of the beams incident on the spherical mirror as shown in Figure 2 and as described in column 4, lines 30-54.

Regarding claim 26, Wood discloses that the spherical mirror is semitransparent as described in column 8, lines 3-7.

In regard to claim 27, Wood discloses (see Figure 2) an optical device for a helmut viewfinder presenting a collimated image to a user, comprising an imager (20a) and an off-axis spherical concave mirror (12), a diffractive field mirror (28) for correcting distortion of an image presented to the user which is due to the off-axis spherical concave mirror as described in column 3, lines 10-40, and a power group placed between the spherical mirror and diffractive mirror which focuses a first intermediate image (26) in proximity to said spherical mirror onto a second intermediate image.

Regarding claim 28, Wood discloses that the diffractive field mirror is disposed so as to be antiparallel with the second intermediate image as shown in Figure 2.

6. Claim 27 is rejected under 35 U.S.C. 102(b) as being anticipated by Rogers U.S. Patent 5,684,634.

In regard to claim 27, Rogers discloses (see Figures 1, 2) an optical device for a helmut viewfinder presenting a collimated image to a user, comprising an imager (11) and an off-axis spherical concave mirror (14), a diffractive field mirror (A, B) for correcting distortion of an image presented to the user which is due to the off-axis

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spherical concave mirror as described in column 2, lines 12-53 and column 5, lines 56-62, and a power group (G, H) placed between the spherical mirror and diffractive mirror which focuses a first intermediate image (13) in proximity to said spherical mirror onto a second intermediate image.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wood U.S. Patent 4,763,990 in view of Chen et al. U.S. Patent 5,436,763.

Regarding claims 17, 18 and 19, Wood teaches the invention as set forth above as well as teaching (in regard to claim 19), that a face of a support of the diffractive field mirror in which the hologram is made is not planar as described in column 6, lines 15-19. However, Wood does not disclose that the diffractive field mirror is a digital plane numerical hologram with discrete variations or that the diffractive field mirror is a plane numerical hologram with a continuous profile. Chen et al. does teach that the diffractive field mirror is a plane numerical hologram with a continuous profile and that the diffractive field mirror is a plane numerical hologram with a continuous profile as described in column 4, lines 27-31. It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the holograms as taught by Chen et al. in the device of Wood in order to provide the diffractive properties.

9. Claims 21-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wood U.S. Patent 4,763,990 in view of Wood et al. U.S. Patent 4,582,389.

Regarding claims 21 and 22, Wood '990 teaches the invention as set forth above but does not teach that the photosensitive material is on a transparent support of variable optical index or that the photosensitive material is on a transparent support of variable thickness. Wood et al. '389 does teach that the photosensitive material is on a transparent support of variable optical index as described in column 5, lines 54-64 and that the photosensitive material is on a transparent support of variable thickness as described in column 7, lines 1-6. It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the volume hologram as taught by Wood et al. in the device of Wood in order to obtain low surface spatial frequency of the hologram.

Response to Arguments

10. Applicant's arguments filed 02 May 2003 have been fully considered but they are not persuasive.

The Applicant argues that the prior art, Wood only teaches a first intermediate image 54 whereas the present invention shows a first intermediate image 25 and a second intermediate image 27 being formed. Furthermore, the Applicant argues that the prior art does not teach or suggest that the diffractive field mirror situated in the vicinity of the second intermediate image.

In response to this argument, the Examiner believes that the claim language as currently recited is indefinite in that the recitation of a first intermediate image is

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misdescriptive of the invention. Figure 3 of the Applicant's invention shows that the spherical mirror is located after a first intermediate image so the combination of the imager and the off-axis spherical concave mirror cannot form a first intermediate image as currently recited. Furthermore, the first intermediate image 25 is also misdescriptive in that the path of the light rays from the imager 20 is such that the first intermediate image would be formed in the first part or section of the optical device as is shown at element 27. This same argument applies to the recited "second intermediate image" being formed. Given the ambiguity surrounding the first and second intermediate images, the prior art is still interpreted as reading on the intermediate image and such that the diffractive field mirror is situated in the vicinity of the intermediate image.

The Applicant further argues that Wood does not show that the diffractive field mirror is antiparallel with the second intermediate image.

In response to this argument, the Examiner cites the same ambiguity with regard to the first and second intermediate images as described above.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not

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mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alessandro V. Amari whose telephone number is (703) 306-0533. The examiner can normally be reached on Monday-Friday 8:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on (703) 305-0024. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

ava *ava*
July 7, 2003


MARK A. ROBINSON
PRIMARY EXAMINER